customer number 26645 PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

IN THE APPLICATION OF DOCKET NO.: 3202R

CRAIG D. TIPTON, SHREYASI LAHIRI, AND MARK R. BAKER

SERIAL NO.: 10/645,373 EXAMINER: V. RONESI

FILED: AUGUST 21, 2003 GROUP ART UNIT: 1714

TITLE: MULTIFUNCTIONAL DISPERSANTS

Wickliffe, Ohio

Hon. Commissioner for Patents
P. O. Box 1450
Alexandria, VA 22313-1450

Sir:

DECLARATION UNDER 37 C.F.R. §1.132

I, Craig D. Tipton, declare as follows:

I received a BSc. degree in 1967 from The Pennsylvania State University and a PhD. degree in the field of Organic Chemistry in 1971 from The University of Illinois.

I have been employed by The Lubrizol Corporation since 1971. Since 1974 I have been responsible for the development of automatic transmission fluid technology in one capacity or another at the Lubrizol Corporation.

I am named as an inventor on some 28 United States patents, and I am a coinventor of the above-identified application.

In order to illustrate certain of the advantages of the present invention, the following experiments were performed under my direction and control:

In preparing lubricant formulations it is often desirable to provide a certain defined amount of additive components to the lubricant. Thus, dimercaptothiadiazoles (DMTDs) and boron or phosphorus compounds are often included for their effect on such properties as wear or friction. At the same time, the cost and convenience of supplying additive functionality are important factors for practical acceptability. Accordingly, an additive which supplies a defined amount of DMTD and boron (or phosphorus) functionality to a lubricant at a lower overall treat rate and by means of a

I certify that this correspondence is being deposited with the United States Postal Service as ___ first class ___ express mail in an envelope addressed to Commissioner for Patents, POBox 1450, Alexandria VA 22313-1450[Exp Mail _____]
on Via EFS 10-23-06 By: Terri Peczak

single additive will be, to that extent, superior to a formulation which imparts the same DMTD and boron through a higher treat rate of a more complicated mixture of materials.

I ordered preparation of three lubricant formulations each of which included DMTD, a boron component, and a phosphorus component. Each lubricant formulation was designed to impart the same amount of boron, phosphorus, and DMTD.

Each lubricant formulation contained 4.0 weight percent of a succinimide dispersant (listed amount including the conventional amount of diluent oil) which had been reacted with DMTD in an amount of 14 parts by weight DMTD per 1000 parts by weight of the dispersant. Other conventional lubricant additives were also present in each lubricant formulation in amounts which were held constant in each. formulation.

In lubricant formulation 1, the DMTD-reacted dispersant was not further treated. This formulation also contained 0.077 weight percent phosphorous acid (97%, comercial) as a phosphorus source and 0.75 weight percent tri- C8 alkyl borate as a boron source.

In lubricant formulation 2, the DMTD-reacted dispersant was further reacted with boric acid in an amount of 1000 parts succinimide dispersant : 14 parts DMTD : 30 parts boric acid. The formulation also contained 0.077 weight percent phosphorous acid.

In lubricant formulation 3, the DMTD-reacted dispersant was further reacted with phosphorous acid in an amount of 1000 parts succinimide dispersant : 14 parts DMTD : 14 parts phosphorous acid. The composition also contained 0.75 weight percent tri- C8 alkyl borate.

The composition of each formulation is summarized in the following table:

	Formulation 1	Formulation 2	Formulation 3
Amount of treated dispersant, %	4.0	4.0	4.0
Amount of added boron compound, %	0.75	–	0.75
Amount of added phosphorus compound, %	0.077	0.077	–
Total of the above	4.827	4.077	4.75
Boron content[a]	0.0203	0.0204	0.0203
Phosphorus content[b]	0.0207	0.0207	0.0204
Sulfur content[c]	0.0366	0.0358	0.0362

Notes:

a. Boron contents by formulation. Average measured amounts: 0.0203, 0.0200, 0.0208, respectively.

b. Phosphorus contents by formulation. Average measured amounts: 0.0182, 0.0151, 0.0114, respectively.

c. Sulfur content is primarily determined by the amount of DMTD. Amounts shown are by formulation. Average measured amounts, which will include variable amounts of sulfur from diluent oils: 0.045; 0.039; 0.040, respectively

It is apparent from the data that when the phosphorus component, or – especially – the boron component is incorporated into the dispersant, along with the DMTD, the total amount of additive treatment can be significantly reduced.

I further declare that all statements herein made of my own knowledge are true and all statements herein made on information and belief are believed to be true. I understand that willful false statements and the like are punishable by fine or imprisonment or both (18 U.S.C. 1001) and may jeopardize the validity of the application or any patent issuing thereon.

Craig D. Tipton

10-19-2006 (date)